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Lt. Governor

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Commissioner

June 15, 2017

Andrew Park, Project Manager
Corrective Action Section
Hazardous Waste Programs Branch
U.S. Environmental Protection Agency Region 2
290 Broadway, 22nd Fl.
New York City, NY 10007-1866

RE: Amerada Hess Corp – Port Reading Refinery
750 Cliff Rd
Woodbridge, Middlesex
EPA ID No. NJD045445483
PI #: 006148

AOC – 12 Smith Creek and Detention Basin Comments

Dear Mr. Park:

The New Jersey Department of Environmental Protection (Department) has completed a review of the Smith Creek and Detention Basin AOC-12 Remedial Investigation Workplan dated August 2016 and amended by comments to USEPA on April 28, 2017, submitted pursuant to The Resource Conservation and Recovery Act (RCRA), and the NJDEP Technical Requirements for Site Remediation at N.J.A.C. 7:26E (Tech Rules). The RI Workplan must address these concerns in order to be acceptable under the Department's Technical Requirements for Site Remediation, N.J.A.C. 7:26E-4.1, Remedial Investigation Requirements. Presently, the RI Workplan is not consistent with the applicable Technical Requirements for Site Remediation (N.J.A.C. 7:26E-3 and 4), and NJDEP Guidance Documents including, but not limited to, the following:

- Conceptual Site Model
- Characterization of Contaminated Ground Water Discharge to Surface Water
- Ground Water SI/RI/RA
- Soil SI/RI/RA
- Ecological Evaluation Technical Guidance
- Field Sampling Procedures Manual

The RI Workplan does not include characterization of LNAPL impacts in filled areas outside of the limits of current surface water bodies.

SPECIFIC COMMENTS:

1. Section 3.1 HISTORY: The Department does not concur with the description of the creation of Smith Creek Pond. Dike construction and creation of the Head of Smith Creek basin was completed sometime between 1970 and 1972. This fully separated the site from Smith Creek. Aerial photos dated 1957-1970 show continued communication between on-site and off-site Smith Creek. The RI Workplan must include sampling locations in the LNAPL impact areas shown in the aerial photos. Aerial photograph copies are attached (1940-2013) that focus on the AOC 12 investigation area.

2. Section 3.2 DESCRIPTION OF CURRENT CONDITIONS: The description of current conditions is extremely limited. The following information must be part of the development of a Conceptual Site Model to support the field sampling plan:
   - Ground water and surface water elevation data: Summarize elevation data for the surface water bodies and monitor wells (November 2014 – November 2016, and the May 2015 gauging events).
     - November 2014 and May 2015 ground water elevations were based on the December 2014 well survey (4th Quarter 2014 Progress Report).
     - Hess must provide corrected ground water elevation data for the November 2015 and November 2016 gauging events using the December 2014 survey data.
     - Hess must provide corrected ground water contour maps for 2015 and 2016 site wide gauging events for each monitoring interval (shallow, intermediate, deep).
     - Evaluate vertical gradients (up or down) at well clusters.
     - Evaluate existing information on ground water and surface water elevations for an initial understanding of ground water – surface water interaction in the investigation area.
   - Provide additional figures to support proposed sample locations that includes:
     - Relevant information from aerial photos, site operations, existing RI data, etc. to support ground water, soil, sediment and surface water sample locations, including, at a minimum:
       - Limits of the 1969 AST failure impact area to previously filled areas, wetland areas and to Smith Creek.
       - Locations of LNAPL impacts in off-site Smith Creek areas (1963 photos and later).
       - All former lagoon limits based on aerial photos in proximity to Smith Creek Pond. [NOTE: Hess figures included schematic information that is not to scale, or did not show the actual location and dimensions of the unit.]
       - All former (capped) point source discharge piping locations.
       - Historic spill impact area limits.
       - Underground piping locations (storm water, petroleum pipelines, process wastewater, API separator wastewater, etc.) through and around the investigation area.
       - AOC 5 Aeration Basin catalyst fine closure material staging area(s) (e.g. materials removed from the basins, materials placed in the basin (catalyst fines), and any other fill staging areas.
       - TW and boring locations throughout the 1969 AST failure impact area, highlighting those that identified LNAPL and/or site COCs.

- Monitor well locations in AOCs around the Smith Creek Pond, including AOC 5 and AOC 10 monitor wells, all Southern Remediation Management Unit wells, and the perimeter well locations.
- Surface water gauging stations – existing and proposed.
- Ammonia ground water results in the investigation area.
- Dissolved VOC plume results in the investigation area.
- Piping connections/culvert construction at all bridges allowing surface water flows from Arthur Kill to Head of Smith Creek basin.

3. Section 4, 4.1 and 4.2 SUMMARY OF AOC 12 GROUNDWATER INVESTIGATION ACTIVITIES AND GROUND WATER QUALITY DATA:
   - The investigation is not limited to the perimeter well data in the dike and aeration basin areas, and water quality data.
   - Provide ground surface elevation of wetland areas impacted by the 1969 AST failure prior to filling and current ground surface elevations. Confirm temporary well completion intervals and soil sample intervals characterize LNAPL impacts from the 1969 AST failure and other releases and waste management units.
   - The Department notes that based on the perimeter well locations summarized and November 2016 data:
     - MTBE and TBA increased at PER-2D, PER-3D, PER-9DD (2015 to 2016)
     - Ammonia increased at AB-4D, PER-3D, PER-10, PER-9D, and decreased at PER-10D (2015-2016).
     - 1,4-dioxane analytical results were not provided with the 2016 data report.
     - Inorganics may not be solely attributable to "historic fill". Inorganic results will be reviewed in total based on locations and site operational history. Metals are present in refining wastes, products and processing materials. Inorganic data evaluation will not be limited to arsenic, lead and chromium.
     - All ground water quality data will be compared to surface water aquatic life and human health criteria to evaluate potential impacts to surface water/ecological receptors.

4. Section 5.0 REMEDIAL INVESTIGATION WORK PLAN:
   - The investigation does not include filled LNAPL impacted areas (wetlands, former creek bed).
   - All investigation results will be reviewed with information on site operations and site development. Inorganic COCs are not presumed to be "historic fill constituents".
   - Identify the wetlands area to be subject to the "Letter of Interpretation" on a figure.
   - The RIW must evaluate ground water and surface water elevation data and a tidal survey.
   - The Department reminds Hess of the following:

     The surface water classification of Smith Creek is FW2-NT/SE3, and the designated uses are identified at N.J.A.C. 7:9B-1.12(f). Where existing surface water quality is worse than established criteria, it is to be improved. Where existing surface water quality is better than criteria, it is to be protected.

COCs in ground water near surface water, and COCs in surface water, will be evaluated with respect to surface water quality remediation standards narrative and numeric criteria (human health, acute aquatic, chronic aquatic) and other ecological screening criteria.

5. Section 5.1 GROUND WATER MONITORING:
   - The ground water sampling plan must include additional wells around Smith Creek Pond and Head of Smith Creek.
   - A well construction summary table is required for wells being sampled. The well screen interval must be identified bgs and below top of inner casing. The current field measured total depth must be provided. The proposed pump intake depth for low flow sampling must be provided. The measuring point elevation and well permit number must also be included in the table.
   - Ground water SVOC analyses must include 1,4-dioxane.
   - General water chemistry parameters are required, including: TDS, chloride, ammonia and nitrate.
   - Field sampling water quality parameters shall be reported, including: pH, DO, specific conductance, temperature, redox.
   - The RIW must include a 48-hour tidal survey at all surface water and ground water monitoring locations to determine (1) tidal influence range and extent, and (2) whether any/all ground water sampling locations need to consider tidal stage to reflect peak low tide/peak high tide conditions.
   - The RIW must include additional ground water and surface water gauging to evaluate horizontal and vertical gradients ground water and surface water interaction:
     - Surveyed surface water gauging locations are required in Smith Creek Pond, Head of Smith Creek basin, and Smith Creek. More than one gauging location may be necessary in Smith Creek.

6. Section 5.1.1 QUARTERLY GROUND WATER MONITORING:
   - The Department does not object to increased sampling frequency at any wells if it does not delay other investigation actions.
   - NJDEP will not accept a CEA proposal for a section of wells at one part of the site perimeter. The CEA discussion is premature.

7. Section 5.2 LETTER OF INTERPRETATION:
   - Include a copy of the figure showing the wetland area of concern subject to the letter of interpretation.

8. Section 5.3 SEDIMENT AND SURFACE WATER SAMPLING – ALL SECTIONS/PHASES:
   - Ground water seeps and springs in Smith Creek Pond, Head of Smith Creek basin and Smith Creek must be identified and included in the sampling plan.
   - Identify tidal stage(s) for surface water sampling.
   - Surface water samples must be from the 0-6" interval above the sediments (bottom of the water column). Additional samples in a longer water column may also be analyzed.

Refer to the Ecological Evaluation Technical Guidance Document, Characterization of Contaminated Ground Water Discharge to Surface Water Technical Guidance Document.

- Surface water sample parameters must also include: 1,4-dioxane, TDS, ammonia (unionized), and nitrate.
- Sediment sampling at 0-6" and 6-12" with a sediment coring device or dredge is not approved. Sediment sampling plan development instructions are attached.
- The sediment/surface water sample locations proposed in Figure 3 need to represent:
  - impacts from adjacent areas (e.g. release areas, former lagoons);
  - impacts in the predicted heart of a ground water plume discharge zone;
  - locations of underground piping beneath the surface water body;
  - Historic LNAPL impact areas (aerial photos).
  - Point source discharges (current, historic).
- Sediment sample parameters must also include: 1,4-dioxane, ammonia and nitrate.

9. Section 5.3.1 DETENTION BASIN SURFACE WATER/SEDIMENT SAMPLING:
   - Figure 3 must include relevant data to support the proposed/additional locations.
   - LNAPL impacted wetlands may be at the bottom of Smith Creek Pond, or beneath a layer of fill within the pond limits. This must be accounted for in the sampling plan.
   - Ground water may discharge to the pond as bank discharges, seeps or spring discharges. Locating the different zones can focus sampling. See NJDEP guidance documents.

10. Section 5.4 PHASE I SMITH CREEK SURFACE WATER/SEDIMENT SAMPLING: Head of Smith Creek basin and Creek Section I – the basin was constructed around 1972 in an area LNAPL impacted area. In site visits, the basin was empty at low tide. Creek Section 1, 2 and 3 had LNAPL release impacts.
    - Figure 3 must include relevant data to support the proposed/additional locations.
    - Samples in Head of Smith Creek basin: Include a location closest to PER-10/10D, and at the Port Reading storm water outfall.
    - Evaluate the Head of Smith Creek basin and Smith Creek for seeps and springs to include in the sampling plan.
    - Determine Head of Smith Creek basin connections to Smith Creek, and flow connections at each bridge

11. Hess states that arsenic and lead impacts are likely due to the presence of historic fill. Hess must submit documentation supporting that statement.

12. Page 9 Section 5.1.1. Improperly relies on a CEA as a remedy when the RI phase is not completed. Per N.J.A.C. 7:26E-4.3(a)3. Hess must delineate the horizontal and vertical extent of all ground water contamination to the ground water remediation standard;

13. Per the workplan Page 9, Section 5.2, states no invasive activities will be conducted within the wetlands prior to wetlands confirmation and determination if permits are required. The Department notes that Hess has been aware of the potential presence of wetlands habitat and could have taken steps earlier to conduct wetlands delineation, request a Letter of Interpretation, and determine permit requirements. Waiting for EPA and DEP approval

unnecessarily protracts the remedial investigation schedule. Hess must identify when they intend to propose a sampling plan for the wetlands.

14. The workplan does not sufficiently demonstrate that the Area of Concern will be fully characterized. For example, proposed sediment sample depths (0 to 6 inches and 6 to 12 inches) might not extend deep enough to investigate the facility's potential impacts to the water bodies. The workplan must comply with the NJDEP Technical Requirements and the NJDEP Ecological Evaluation Technical Guidance.

If you have any questions regarding this correspondence, please reach me by phone at (609) 292-0395, or email at Phil.Cole@dep.nj.gov.

Sincerely,

Philip Cole, Case Manager
Bureau of Case Management

cc: John Schenkewitz, Hess Corporation
John Virgie, LSRP, Earth Systems
Ann Charles, Technical Coordinator
Jill Monroe, Geologist

Attachment 1: Aerial Photographs
Attachment 2: Sampling Plan Guidance

SOURCE: www.historicaerials.com


Aerial
1979
1972
1970
1969
1966
1963
1957
1954
1947
1940
1931
Topo
T1962
T1957
T1947
+
−
© HISTORICAERIALS.COM
COPYRIGHTED MATERIAL
100 m
500 ft
Leaflet | © OpenStreetMap


Aerial
1979
1972
1970
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1963
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1954
1947
1940
1931
Topo
T1962
T1957
T1947
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© HISTORICAERIALS.COM
COPYRIGHTED MATERIAL
100 m
500 ft
Leaflet | © OpenStreetMap

Full site photo top, Smith Creek close-up bottom:

1957 and 1963 photos: the transition between on-site Smith Creek and off-site Smith Creek was modified, but the connection does not appear to have been eliminated. Fill was also placed under the bridges modifying flow connections. A release already appears to have occurred, prompting the changes at the bridges to flow, and apparent evidence of LNAPL impacts in the part of Smith Creek between the bridges.

Full site photo top, Smith Creek close-up bottom:

1963 and 1966 photos: apparent LNAPL impacts in Smith Creek between the two bridges. This predates the 1969 AST failure. Apparent ditch connection to on-site and off-site Smith Creek.

Full site photo top, Smith Creek close-up bottom:

1969 photos: apparent LNAPL impacts from the 1969 AST failure to on-site filled areas, to on-site and off-site wetlands, and to surface water extending to a containment structure near the marina.

Full site photo top, Smith Creek close-up bottom:

1970 photo: Continued presence of LNAPL. Changes in flow/fill in the isolated/semi-isolated portions of Smith Creek. Flow channels in lower flow areas.

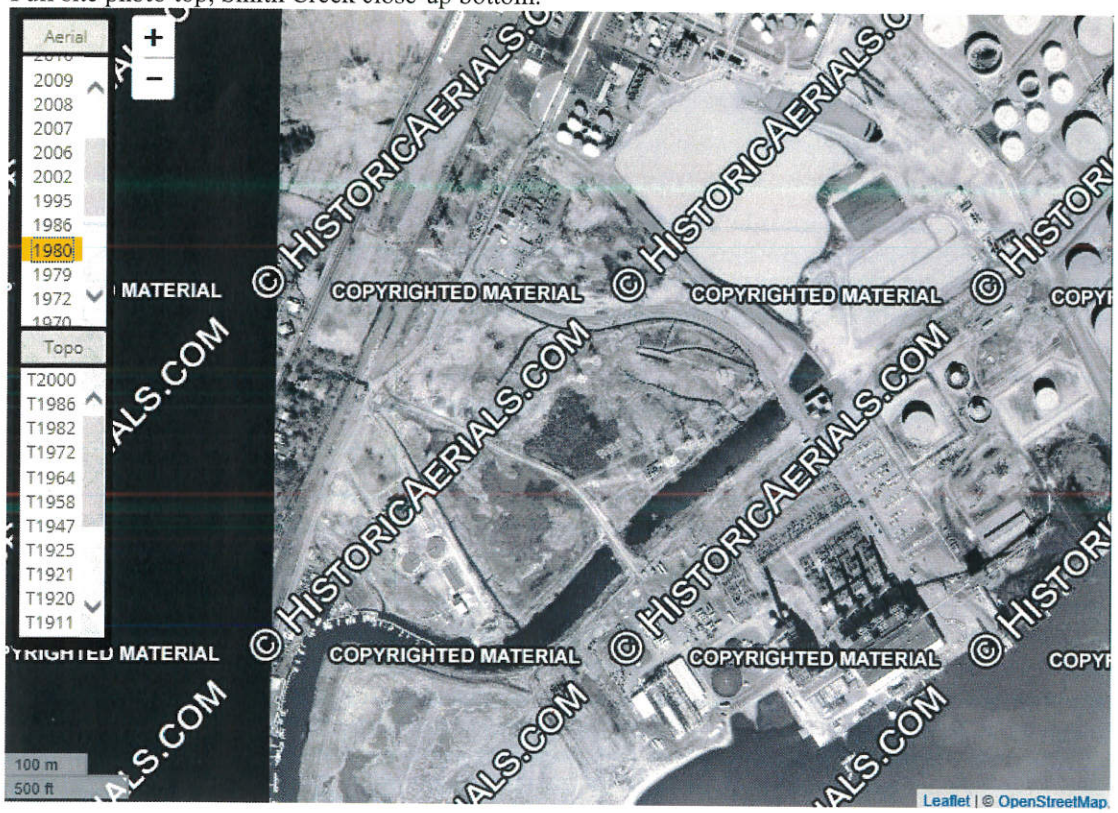
Full site photo top, Smith Creek close-up bottom:

1972 photo: completed dike construction shown that created the on-site detention basin (Smith Creek Pond) and a new "Head of Smith Creek" basin. Fill placed in the Smith Creek stream bed and wetlands between the dike and PSE&G generating station access road. Containment feature limiting Smith Creek flow near the marina was removed. Smith Creek flow conditions restored.

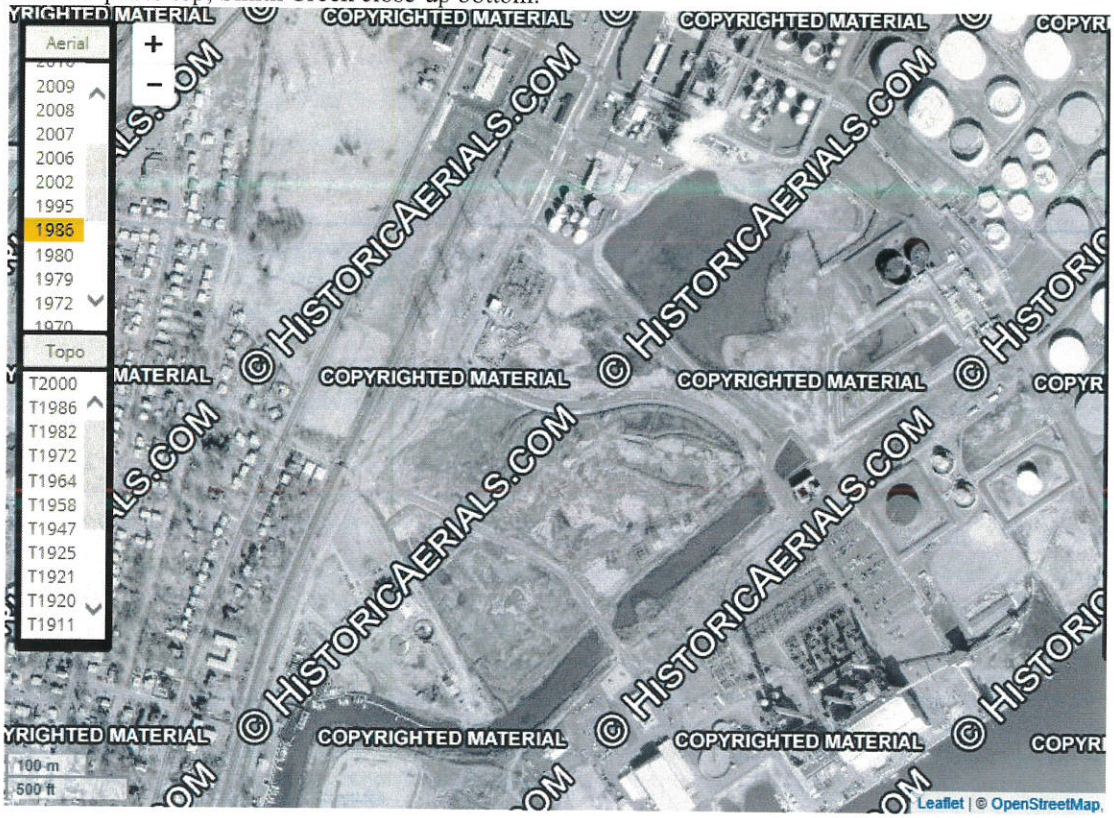
1972-1986 photos: continued fill placement in former on-site creek bed and wetland areas to construct (and then close) the mini-lagoon and the backwash lagoon, create land to construct wastewater treatment facilities, close the Oily Water Lagoon. Over time, fill continues to be placed over oily shorelines next to lagoons, the dike, the truck loading rack and day tank field areas, the API Separator, etc. Made land areas increase and detention basin/Smith Creek Pond area decreases.

Full site photo top, Smith Creek close-up bottom:

Full site photo top, Smith Creek close-up bottom:

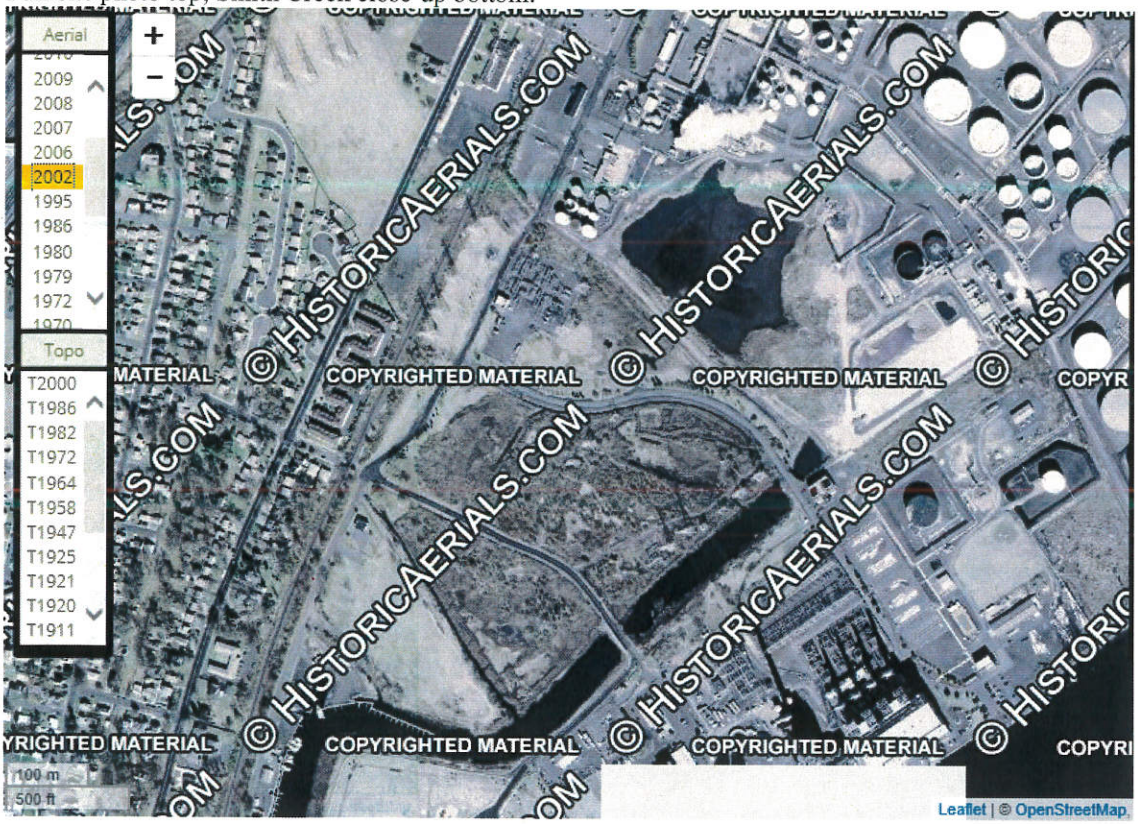


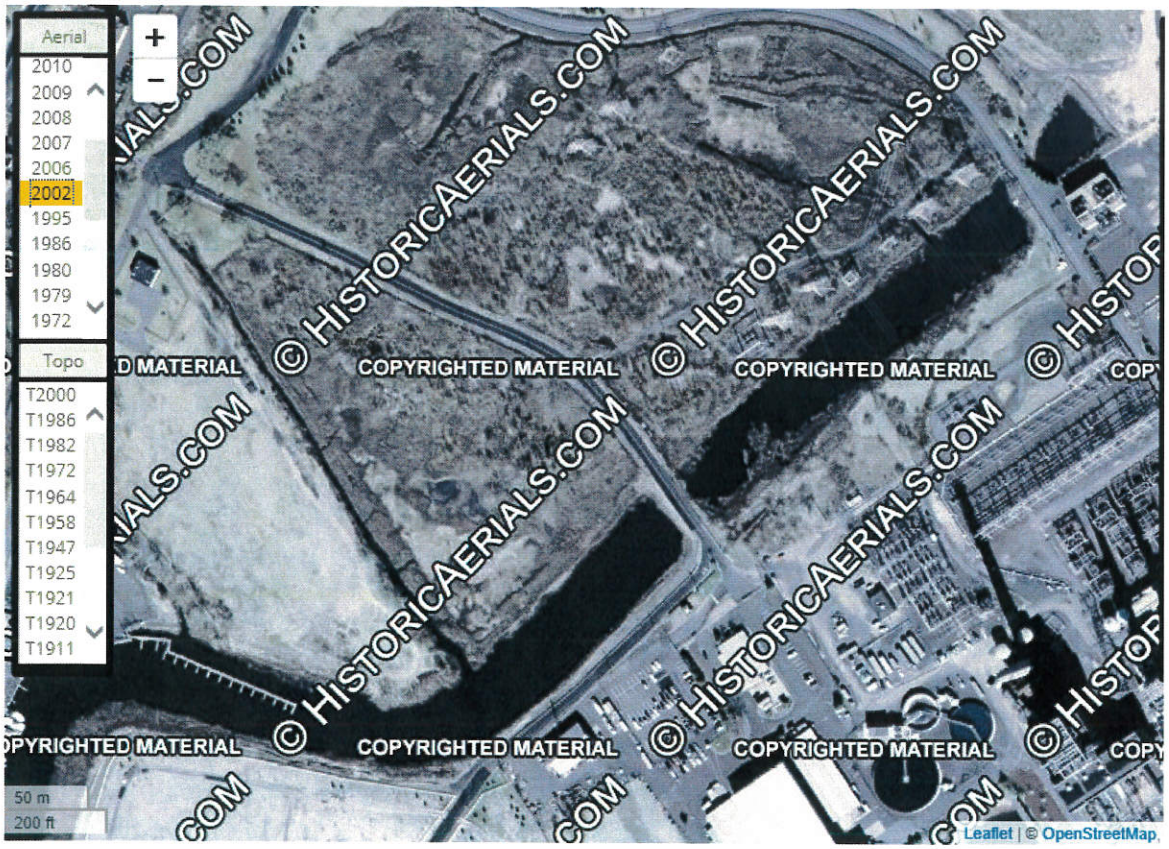
Full site photo top, Smith Creek close-up bottom:



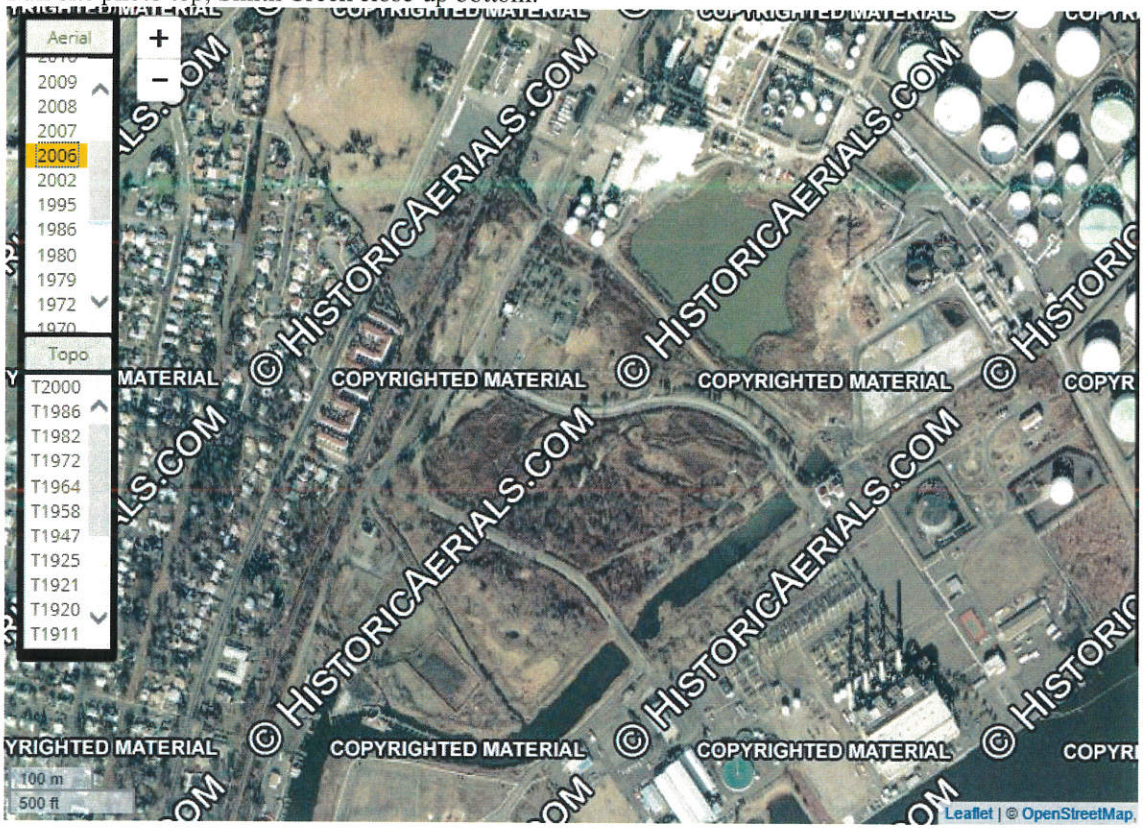
NOTE: 1995 aerial photo too dark

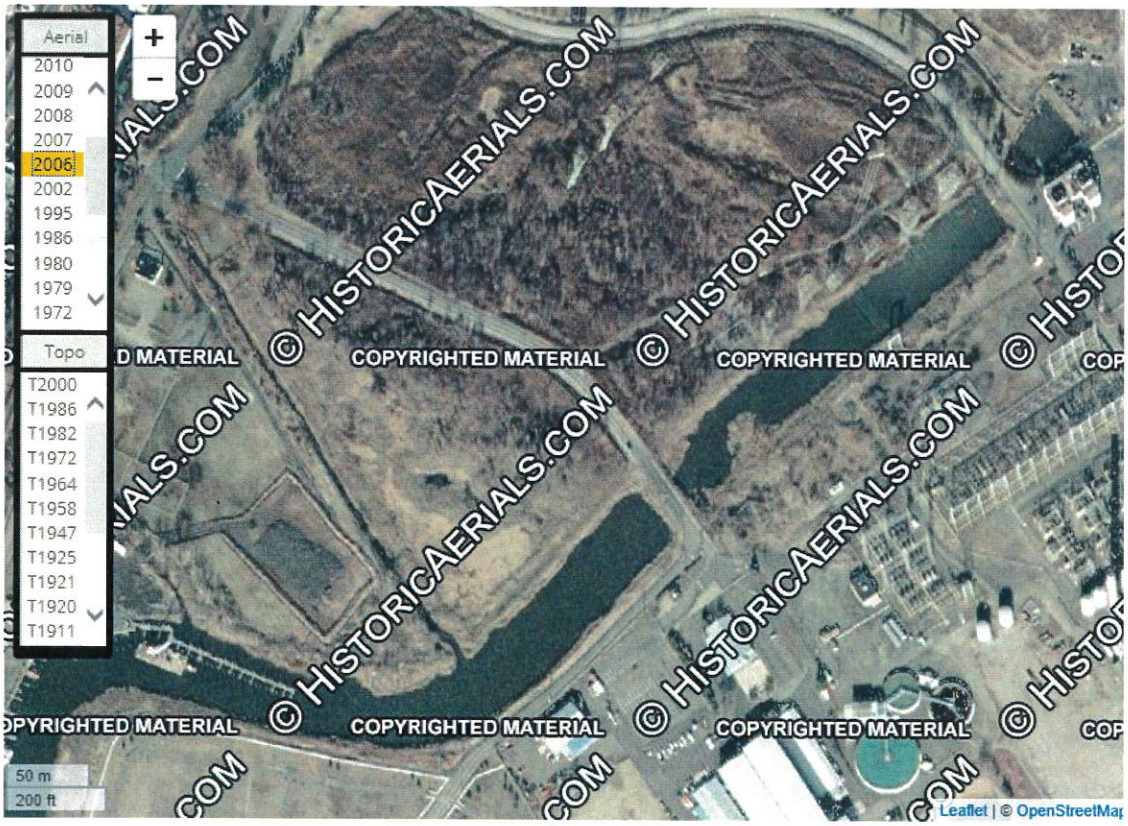
Full site photo top, Smith Creek close-up bottom:





Full site photo top, Smith Creek close-up bottom:





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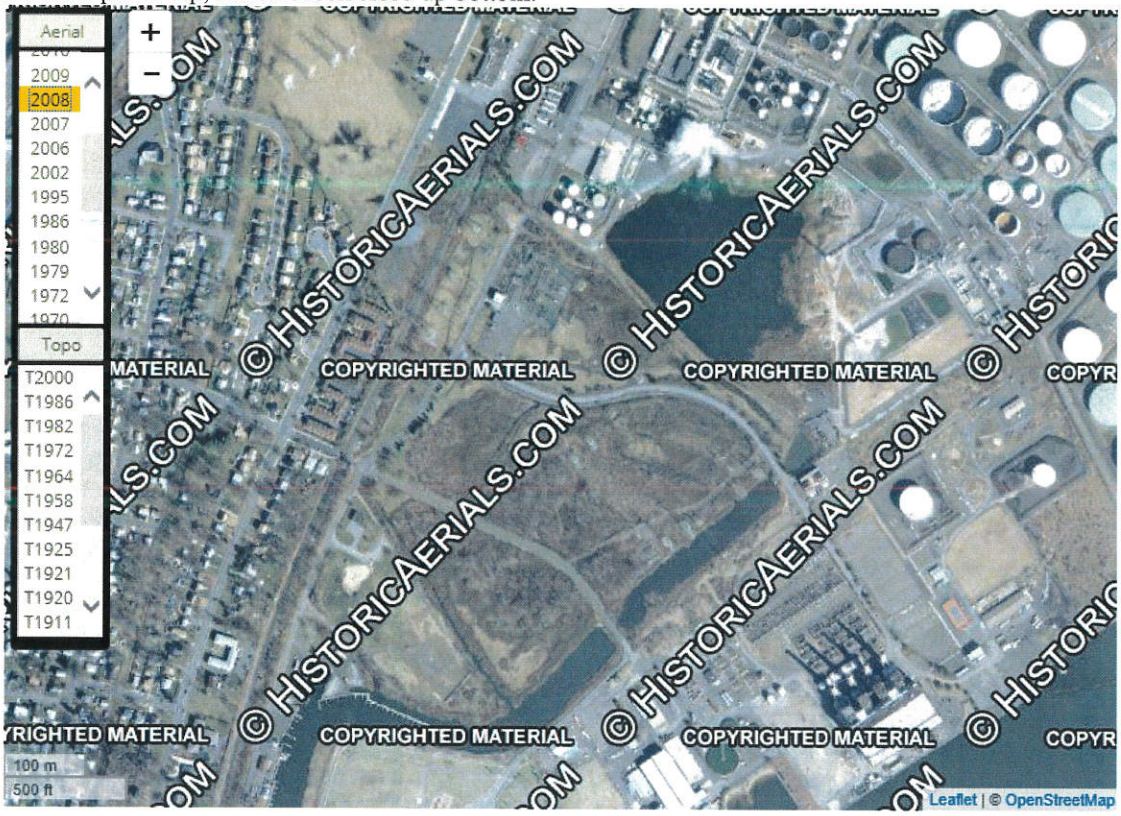
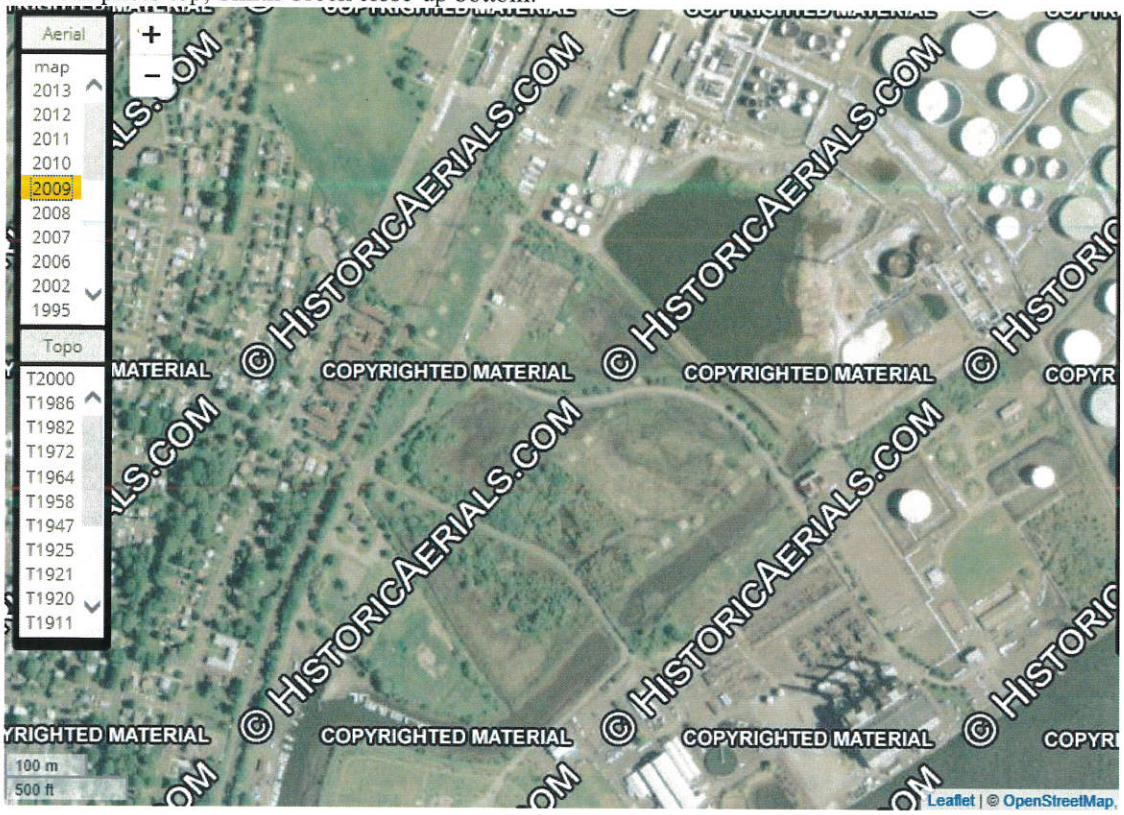
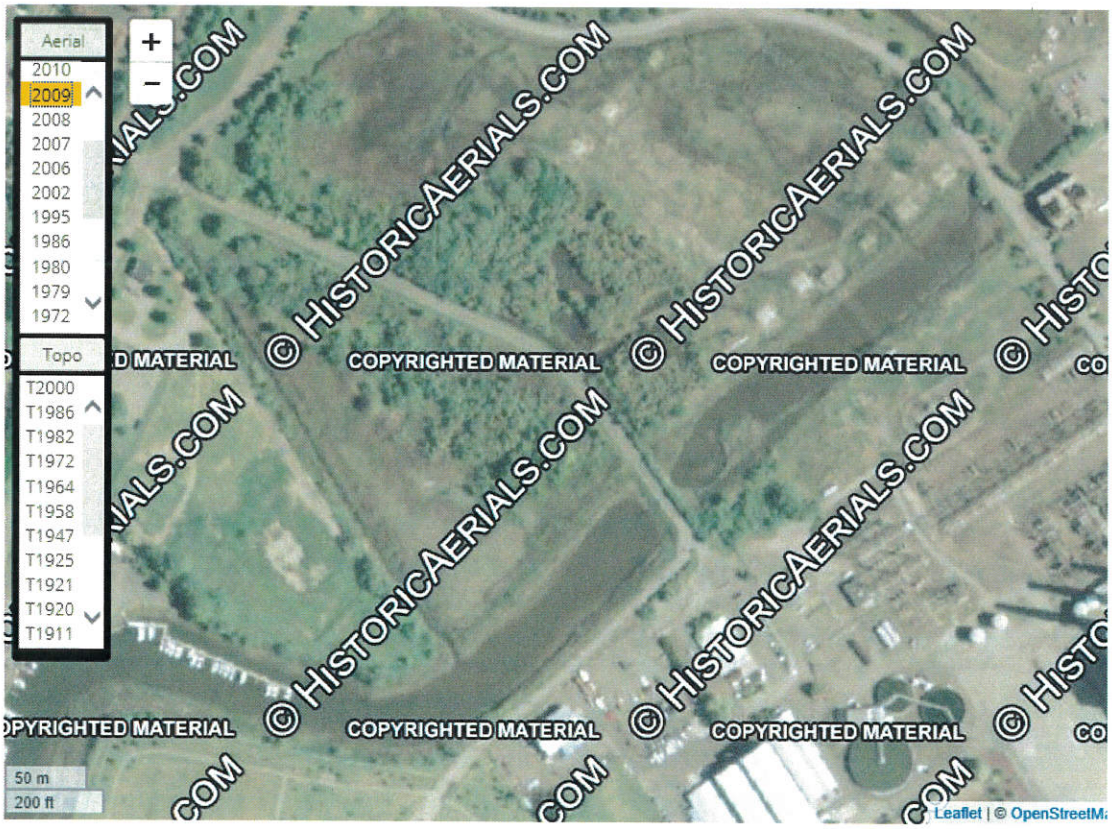
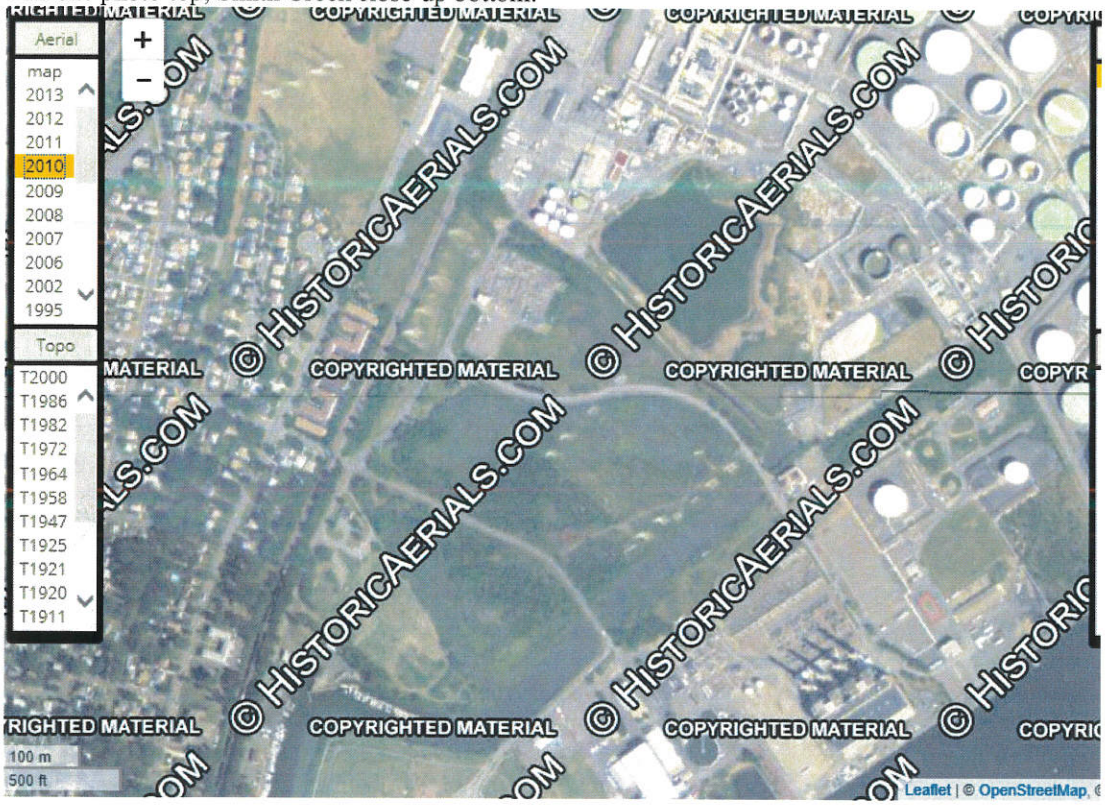


Full site photo top, Smith Creek close-up bottom:

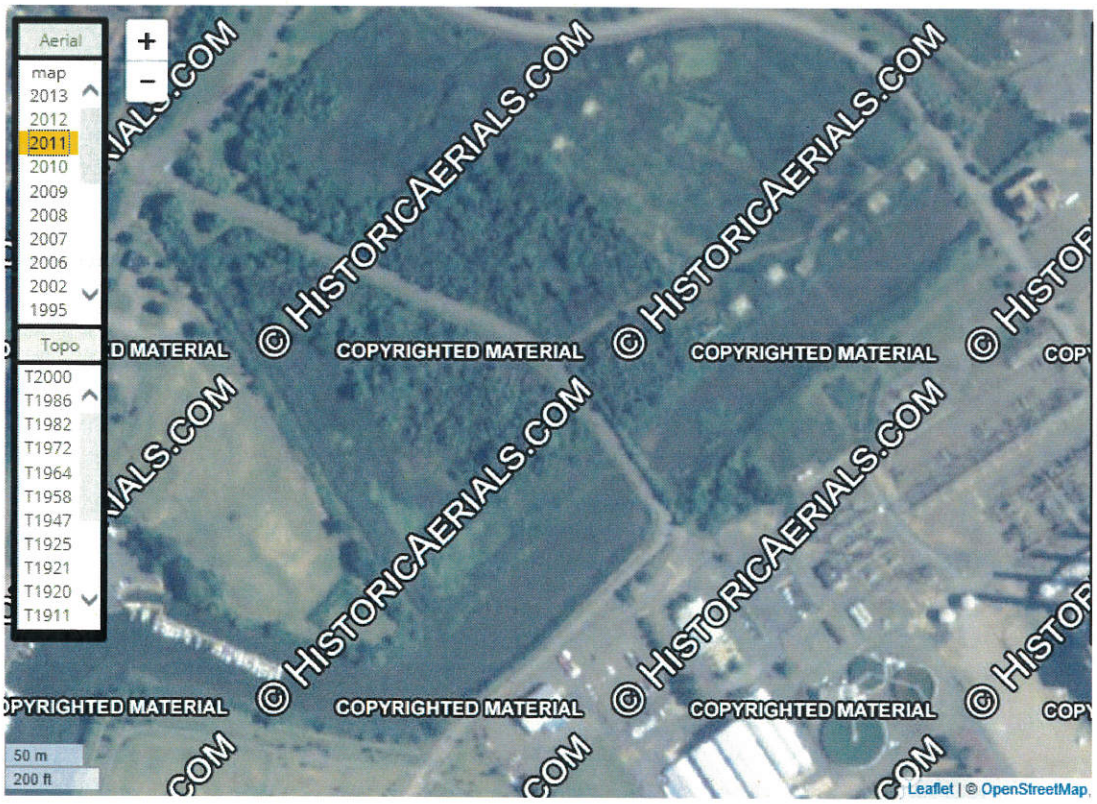




Full site photo top, Smith Creek close-up bottom:



Full site photo top, Smith Creek close-up bottom:



Full site photo top, Smith Creek close-up bottom:

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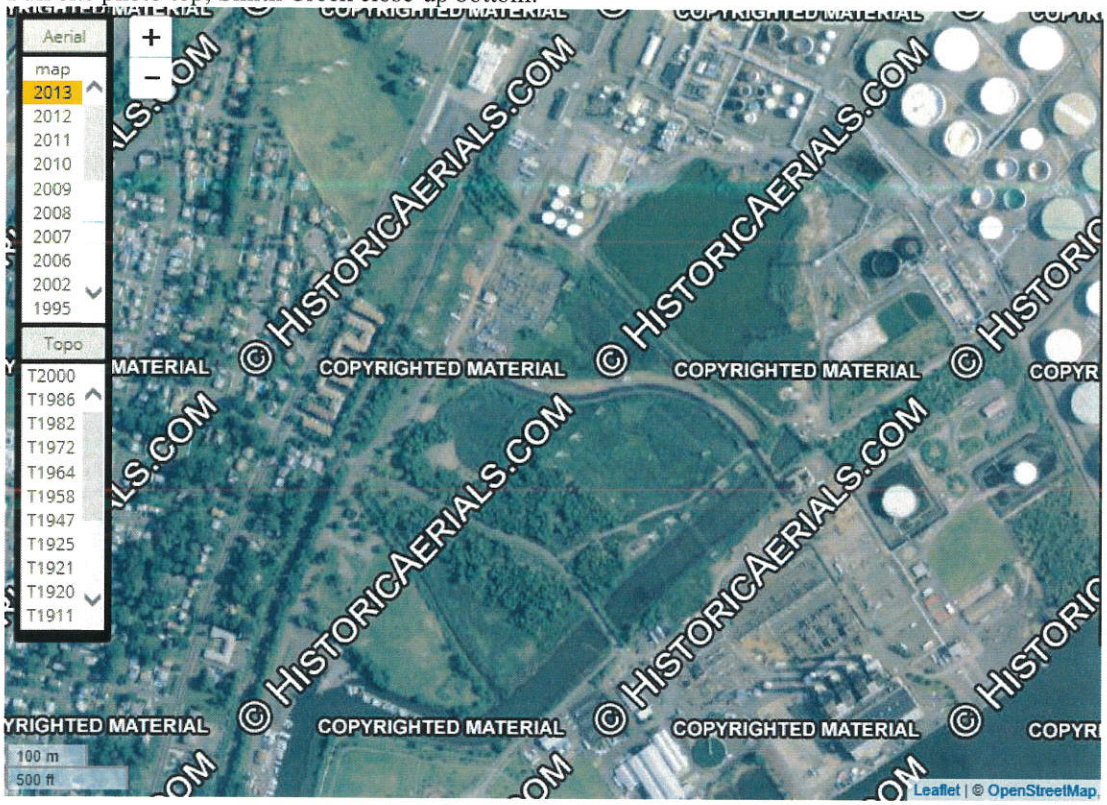

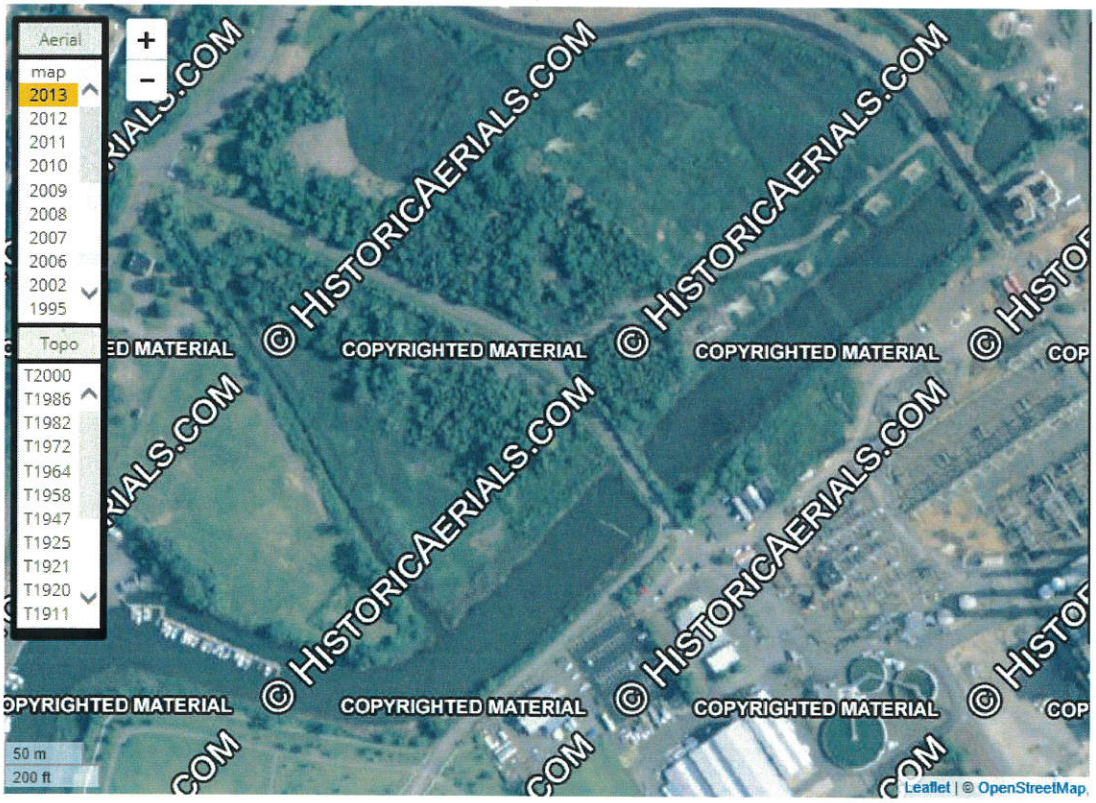

Sediment Field Sampling and Analysis Plan Guidance:

Impacts to Smith Creek Pond, Head of Smith Creek Basin, and Smith Creek sediments associated with the Amerada Hess site must be investigated pursuant to N.J.A.C. 2.1(a)14; 2.1(d); 3.6, 4.8, 5.1 (e), et al., and the *Ecological Evaluation Technical Guidance* (EETG), February 2015. The Field Sampling and Analysis Plan (FSAP) must be designed to characterize and delineate site-related free and residual petroleum product and other site-related contaminants, such that the locations, extent, depth, and approximate volume of contamination in Smith Creek Pond, Head of Smith Creek Basin, and Smith Creek can be identified. The following comments pertain to the identification of the free and/or residual petroleum product footprint; characterization and delineation of other site contaminants beyond the product footprint are also required.

Location and number of sediment cores – The selection of the sediment investigation area associated with the Amerada Hess facility should be developed in accordance with a site-specific conceptual site model (CSM) and biased toward suspected areas of greatest contamination. Information to be considered should include, but not be limited to, site topography, creek bed elevations, sediment lithology, regional/site hydrogeology, location of known releases/extent of product at the former Areas of Concerns (AOCs), known historic contaminant migration pathways from the site to Smith Creek Pond, Head of Smith Creek basin, and Smith Creek, and geomorphic characteristics (e.g., mudflat presence). Using a transect, grid and/or stratified grid sampling approach (i.e., progressive grid spacing), a sufficient number of sediment cores must be collected to achieve full horizontal and vertical delineation of site related free and residual petroleum product. The FSAP should include contingencies for more than one round of data collection. For the purpose of product delineation in any surface water body sediment, during any sampling round, boundary samples should be collected from the apparent clean zone (free of product) underneath and side gradient to the contaminated zone where product is encountered and from corresponding depths in adjacent boring locations.

Sediment Core Collection – In accordance with the EETG, Section 5.3.3.1, continuous sediment cores (initial and contingency) should be collected using vibracore (or equivalent) sample collection methodology, and as guided by site specific CSMs, to a depth necessary to determine vertical product extent (for example, complete depth of unconsolidated sediment identified by pre-FSAP probing, adequately deep initial depth, e.g., 20 feet below sediment surface (bss), or to refusal). The proposed core depth to 1' bss is inadequate to ensure identification of legacy free and residual product. The sediment cores should be opened by cutting the liner longitudinally and screened using a calibrated photoionization detector (PID) with a 10.2-electron volt bulb, visually characterized, and photo-logged. The complete core should be continuously examined for evidence of product using visual and olfactory observations and PID readings. Discrete 6-inch sediment sample intervals per core should be inspected for sediment color and substrate type (color, texture, grain size, etc.) and evidence of contamination (staining, sheens, PID readings, oil/tar globules). Provisions for temporarily archiving select cores, for which re-examination may be useful, should be accommodated.

Sediment Characterization - Visual observations (e.g., NAPL, oil, sheen, staining, stringers, droplets, ebullition, etc.) and olfactory indicators are paramount and in many cases will

represent definitive evidence of free and residual petroleum product. However, pursuant to N.J.A.C. 7:26E-2.1(a)14, for certain cores, the presence/absence of product may need to be determined through use of several lines of evidence including direct observations, field instrumentation, field analysis (e.g., hydrophobic dye tests, UV fluorescence), and/or laboratory analytical data. Sediment samples that clearly contain free and/or residual product (based on the judgement of the LSRP using visual, olfactory and/or field instrument screening) do not need to be submitted for laboratory analysis and must be managed pursuant to N.J.A.C.7:26E-5.1(e). At locations where the presence of product is uncertain based on visual/olfactory observations or field instrumentation, samples should be analyzed for the petroleum product parameters listed in Table 2-1, N.J.A.C. 7:26E-2.1(d). The required analytical parameters per referenced Table 2-1 include: EPH (via NJDEP EPH Method Revision 3), target compound list (TCL) VOAs + TICs, TCL PAH (including naphthalene and 2-methylnaphthalene), target analyte list (TAL) Metals, Cyanide, Phenolics, particle grain size, TOC and pH. Additionally, ammonia and nitrate analyses are required.

Reporting – The RI Report shall conform to N.J.A.C. 7:26E-4.9. Among other items, this report must include sediment coring logs that document: visual and olfactory observations, sediment type/lithology, color, texture, benthic fauna observations, PID readings, and field investigator's comments throughout the core, with depth (bss) indicated. For each sediment area of concern investigated through this FSAP, site-specific figures should identify the estimated footprint of free and/or residual product both horizontally and vertically in the sediment bed. Figures shall also indicate analytical parameter sample locations and concentrations, where applicable

Amerada Hess should note that site-related free and/or residual product must be managed pursuant to N.J.A.C.7:26E-5.1(e). Other site -related contaminants outside of the product footprint must either be remediated to Ecological Screening Criteria (ESC) or background, or an Ecological Risk Assessment must be conducted in order to calculate site-specific ecological risk-based remediation goals.